

Version with Markings to Show Changes Made

Paragraph beginning at line 4 on page 1 (added material underlined)

Cross Reference to Related Applications

This application is a divisional patent application of application, Serial No. 09/754,674, filed January 4, 2001, now U.S. Patent No. 6,365,250, which is a divisional application of Serial No. 09/083,294, filed May 22, 1998, now U.S. Patent No. 6,203,294.

Amended claims 22, 24, 30, 32 and 33 (added material underlined and deleted material in brackets)

22. (Amended) The method of claim 35 [21] wherein said blastomeric material forming said inner tube contains a conductive material.

24. (Amended) The method of claim 35 [21] further comprising the steps of vulcanizing said covered reinforced tube.

30. (Amended) The method of claim 35 [21] wherein said elastomeric material is an acrylonitrile-butadiene rubber.

32. (Amended) The method of claim 35 [21] wherein said reinforcing layer is a layer of fibers selected from the group consisting of polyamide fibers, polyester fibers, rayon fibers, glass fibers and cotton fibers.

33. (Amended) The method of claim 35 [21] wherein said protective cover layer is a layer of synthetic elastomer selected from the group consisting of styrene-butadiene rubber, nitrile-butadiene rubber, chloroprene rubber, chlorinated polyethylene, chlorosulfonated polyethylene, epichlorohydrin ethylene oxide copolymers, polyvinyl chloride, and blends thereof.

REMARKS

Review and reconsideration of this application are respectfully requested.

The specification is amended at page 1, line 4 to update the cross-reference to related applications.

Claims 21 and 31 have been canceled, claims 22, 24, 30, 32 and 33 have been amended to change the dependency of such claims, and new claims 35-42 have been added to better define the present invention.

Claim 21 has been replaced with new independent claim 35 for the purpose of placing the subject matter of present invention in better form. Specifically, the new claim 35 defines the first tubular structure as simply a first polymeric tubular structure without requiring that it be an elastomeric material, and the second tubular structure as simply a second polymeric tubular structure without requiring that it be a barrier layer. In accordance with the new claim 35 either the first tubular structure or the second tubular structure may be the barrier layer and the other tubular structure is the elastomer layer. New claim 35 is supported by the specification at page 7, line 21 through page 8, line 25; page 12, lines 21-23; page 13, lines 12-16; and figures 1-5 of the drawings.

Claims 21-25 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feit et al in view of Johnson et al and Rossetti. The Examiner alleges that Feit taught that it was known at the time the invention was made to form a hose with an inner layer 1 formed via extrusion of an acrylonitrile-butadiene rubber and that it was known to apply a barrier layer 3 onto the acrylonitrile-butadiene-layer via extrusion. The Examiner states that the barrier layer material includes a terpolymer derived from tetrafluoroethylene, hexafluoropropylene and vinylidene fluoride. It is further alleged, based on the description by Feit (col. 3, line 49-col. 4, line 5), that the barrier component would appear to be elastomeric.

Applicant finds no teaching in Feit to support the Examiner's statement that the tetrafluoroethylene-hexafluoropropylene-vinylidene fluoride terpolymer is elastomeric. To the contrary, Feit specifically states in the abstract the present invention relates to a hose construction containing a fluoroplastic barrier, not a fluoroelastomeric barrier as suggested by the Examiner.

The Examiner admits that Feit fails to make mention the specific fluoropolymer employed by applicant as the barrier material. However, the Examiner then goes on to allege that Johnson et al teaches that it was well known at the time of the invention to provide a blend of a thermoplastic fluorocarbon polymer and an elastomeric fluorocarbon polymer wherein the blended polymer had improved properties over the use of one of the elastomeric polymer or the thermoplastic polymer. The Examiner's allegation is derived from only a brief section of one paragraph, Col. 1, lines 29-34 , of the Johnson patent. Actually, Johnson goes on to say: "However, as reported in that patent, while the resulting composition may have certain improved properties, such as tensile strength and elongation, the resulting composition has relatively poor heat aging properties. "Further, while the elongation is somewhat improved it is still too low for certain uses." Therefore, Johnson could be interpreted as teaching that blends of thermoplastic fluoropolymers and elastomeric fluoroplastic polymers have undesirable properties. In fact, at col.1, lines 41, Johnson states: "Subsequent work on vinylidene fluoride-tetrafluoroethylene thermoplastic copolymers, as reported in more detail below, supports the conclusion that the addition thereto of an elastomeric vinylidene fluoride-hexafluoropropylene copolymer undesirably and uncontrollably lowers the secant modulus. "In certain compositions, depending on the secant modulus of the particular vinylidene fluoride polymer used, the modulus may be too high and elongation too low for use of the composition in preparing flexible heat shrinkable tubing and in others, the modulus may be too low to prepare satisfactory heat shrinkable tubing." Therefore, a blanket statement that it is known to provide a blend of a thermoplastic fluorocarbon polymer and an elastomeric fluorocarbon polymer to obtain improved properties is incorrect since such blends are known to reduce certain physical properties as well as improve certain physical properties.

The Examiner further states that Johnson suggests, at col.2, lines 42-61, that the fluoroelastomer member of the blend includes terpolymers of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene, and that Johnson additionally suggests that for the thermoplastic fluoropolymer, one would have chosen a blend of vinylidene fluoride and hexafluoropropylene, however terpolymers would also have been useful, col. 2, lines 24-30.

Applicant contends that while Johnson teaches an elastomeric terpolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene as the elastomer component, there is no teaching of a thermoplastic terpolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene as alleged by the Examiner. According to Johnson, col. 2, lines 24-30, the thermoplastic component is a copolymer of vinylidene fluoride and hexafluoropropylene which may or may not contain minor amounts of suitable terpolymer units such as fluoropropylene or perfluoroethoxyethylene. The Examiner will note that tetrafluoroethylene is conspicuously absent from this list of suitable terpolymer units. Therefore, Johnson does not teach a thermoplastic fluoro terpolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene.

The Examiner asserts that in the examples of Johnson, the thermoplastic fluoropolymer selected includes vinylidene and hexafluoropropylene under the trade name KYNAR FLEX 2800 as well as a blend of vinylidene fluoride and tetrafluoroethylene and, while the reference fails to make mention of a thermoplastic fluoropolymer which is a terpolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene, the patent to Rossetti suggests that KYNAR would have included tetrafluoroethylene within the blend of polymer of vinylidene fluoride and hexafluoropropylene (col.3, lines 5-9). Applicant vigorously disagrees with the Examiner's position that KYNAR inherently includes tetrafluoroethylene as a component. According to Rossetti, the examples 1(col. 3, line 11), 2 (col. 2, line 43) and 3 (col. 4, line 41)specifically employ KYNAR 5,200 which is a vinylidene fluoride polymer containing about 5% tetrafluoroethylene (col. 2, lines 5-8). Johnson employs KYNAR FLEX 2800 (vinylidene fluoride-hexafluoropropylene copolymer) in example1, samples A and B. In samples C and D,

KYNAR 7200 (vinylidene fluoride-tetrafluoroethylene copolymer) was employed. In example 2 KYNAR 461 (vinylidene fluoride homopolymer) was employed. In example 3 KYNAR 2800 (vinylidene fluoride-hexafluoropropylene copolymer) was employed. Obviously, KYNAR includes various copolymers and homopolymers; however, there is no suggestion in either the patent to Johnson or to Rossetti that KYNAR includes a terpolymer of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene. Therefore, applicant contends that there is no teaching whatsoever in any of the cited references either alone or in combination that would provide the incentive for one to employ a blend of a thermoplastic vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene terpolymer with an elastomeric vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene terpolymer in a method for the production of a fuel hose.

With respect to the rejection of the various dependent claims, applicant contends that such claims simply are included simply for the purpose of defining certain limitations of the base claim and it is believed that such claims do not impact the allowability of the base claim. Accordingly, it is requested that this rejection of the base claim and all dependent claims be withdrawn.

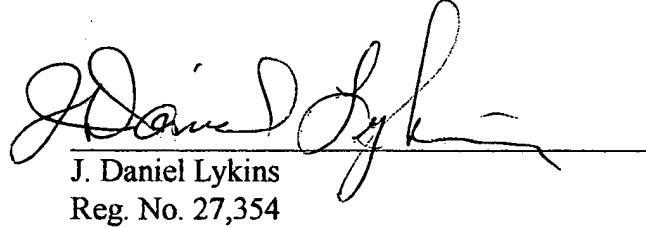
Claims 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above further taken with the applicant's admitted prior art. More specifically, the Examiner alleges that Feit suggests that one skilled in the art at the time the invention was made would have incorporated a curing agent within the rubber compound described therein. While there is no evidence to suggest that one would have selected the specific curing agent added, the Examiner states that one skilled in the art of hose manufacture wherein the core was formed from acrylonitrile butadiene rubber would have understood to utilize conventional vulcanizing agents for the same and such would have included those described by applicant. Additionally, the applicant has admitted that those skilled in the art were well aware of the desired amount of vulcanizing agent added to the composition. The Examiner suggests that it would have been obvious to one of ordinary skill in the art at the time the

invention was made to utilize the conventionally and commercially available vulcanizing agents of the known and admitted prior art of the disclosure in the hoses manufactured according to the techniques set forth earlier in the office action.

Again, the rejected claims are dependent claims which simply further define certain limitations of the base claim and such dependent claims do not impact the allowability of the base claim.

Applicant stresses the present claims as amended is directed to a method of producing a flexible hose having fuel barrier properties for use in a fuel transport system wherein the barrier layer is formed from a blend of about 20 to 80 weight percent of a first hexafluoropropylene-tetrafluoroethylene-vinylidene terpolymer having a fluorine content of about 65 to 73 weight percent and exhibiting elastomeric characteristics, and about 80 to 20 weight percent of a second hexafluoropropylene-tetrafluoroethylene-vinylidene fluoride terpolymer having a fluorine content of about 70 to 75 weight percent and exhibiting thermoplastic characteristics. None of the cited references either alone or in combination teach this fluoropolymer blend which contains two hexafluoropropylene-tetrafluoroethylene-vinyl fluoride terpolymers, one of which exhibits elastomeric characteristics and the other exhibits thermoplastic characteristics. Therefore, it is believed that this rejection can be withdrawn.

Respectfully submitted,



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